

What is claimed is:

5 1. A data transfer control device for transferring data among a plurality of nodes that are connected to a bus, the data transfer control device comprising:

10 a transfer execution circuit that operates when a processing means has issued a first start command which instructs continuous packet transfer by hardware, for executing processing to divide transfer data into a series of packets and transfer the thus divided series of packets continuously; and

15 an arbitration circuit that operates when the processing means has issued a second start command which instructs packet transfer while continuous packet transfer processing is being executed by the transfer execution circuit, for waiting until one transaction or one packet transfer in the continuous packet transfer has been completed then permitting packet transfer by the second start command.

20 2. The data transfer control device as defined in claim 1, wherein the transfer execution circuit comprises at least one of:

25 a page table fetch circuit that operates when a page table exists in a storage means of another node, to fetch the page table from the other node;

a page table creation circuit that operates when no page table exists in the storage means of the other node, to create a virtual page table, based on page boundary information;

a payload division circuit for dividing transfer data into packets of a payload size;

a transfer execution control circuit for controlling the execution of data transfer; and

5 a control information creation circuit for creating control information of a request packet to be sent to the other node.

10 3. The data transfer control device as defined in claim 1, wherein the arbitration circuit receives a first start signal that goes active when there is a transfer start request from the transfer execution circuit, a second start signal that goes active when there is a transfer start request in accordance with the second start command, and a completion signal that goes active at transfer completion; then causes the start of transfer processing in accordance with the first start signal when the second start signal went active after the first start signal had gone active, and causes the start of transfer processing in accordance with the second start signal after the completion signal goes active.

20 4. The data transfer control device as defined in claim 1, wherein the arbitration circuit receives a first start signal that goes active when there is a transfer start request from the transfer execution circuit, a second start signal that goes active when there is a transfer start request in accordance with the second start command, and a completion signal that goes

active at transfer completion; and gives priority to transfer processing in accordance with the second start signal when the first and second start signals have gone active together.

5 5. The data transfer control device as defined in claim 1,  
wherein the arbitration circuit receives a first start  
signal that goes active when there is a transfer start request  
from the transfer execution circuit, a second start signal that  
goes active when there is a transfer start request in accordance  
10 with the second start command, and a completion signal that goes  
active at transfer completion; then causes the start of transfer  
processing in accordance with the second start signal when the  
first start signal went active after the second start signal  
had gone active, and causes the start of transfer processing  
15 in accordance with the first start signal after the completion  
signal goes active.

6. The data transfer control device as defined in claim 1,  
further comprising:

20 randomly accessible packet storage means having a control  
information area for storing packet control information and a  
data area for storing packet data; and

an address generation circuit for generating a write  
address to the packet storage means,

25 wherein the control information area of the packet  
storage means is separated into a first control information area  
and a second control information area, control information of

the second control information area being written by the transfer execution circuit; and

wherein the address generation circuit switches between generating addresses for the first control information area and addresses for the second control information area, based on an arbitration result from the arbitration circuit.

7. The data transfer control device as defined in claim 1, further comprising:

randomly accessible packet storage means having a control information area for storing packet control information and a data area for storing packet data,

wherein the data area of the packet storage means is separated into a first data area for storing first data for a first layer and a second data area for storing second data for a second layer that is the object of continuous packet transfer by the transfer execution circuit.

8. The data transfer control device as defined in claim 7, wherein, when a request packet for starting a transaction is transmitted to another node, instruction information for instructing the processing to be performed when a response packet will be received from the other node is comprised within transaction identification information in the request packet;

and

wherein, when a response packet is received from the other node, control information and first and second data of the

response packet are respectively written to the control information area and the first and second data areas, based on the instruction information comprised within the transaction identification information in the response packet.

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9. The data transfer control device as defined in claim 1, wherein data transfer is performed in accordance with the IEEE 1394 standard.

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10. Electronic equipment comprising:

the data transfer control device as defined in claim 1;  
a device for performing given processing on data that has been received from another node via the data transfer control device and the bus; and

a device for outputting or storing data that has been subjected to the processing.

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11. Electronic equipment comprising:

the data transfer control device as defined in claim 2;  
a device for performing given processing on data that has been received from another node via the data transfer control device and the bus; and

a device for outputting or storing data that has been subjected to the processing.

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12. Electronic equipment comprising:

the data transfer control device as defined in claim 6;

a device for performing given processing on data that has been received from another node via the data transfer control device and the bus; and

a device for outputting or storing data that has been  
5 subjected to the processing.

13. Electronic equipment comprising:

the data transfer control device as defined in claim 7;

a device for performing given processing on data that has  
10 been received from another node via the data transfer control device and the bus; and

a device for outputting or storing data that has been  
subjected to the processing.

14. Electronic equipment comprising:

the data transfer control device as defined in claim 9;

a device for performing given processing on data that has  
been received from another node via the data transfer control device and the bus; and

a device for outputting or storing data that has been  
20 subjected to the processing.

15. Electronic equipment comprising:

the data transfer control device as defined in claim 1;

a device for performing given processing on data that is  
25 to be transferred to another node via the data transfer control device and the bus; and

a device for fetching data to be subjected to the processing.

16. Electronic equipment comprising:

5 the data transfer control device as defined in claim 2;  
a device for performing given processing on data that is to be transferred to another node via the data transfer control device and the bus; and

10 a device for fetching data to be subjected to the processing.

17. Electronic equipment comprising:

15 the data transfer control device as defined in claim 6;  
a device for performing given processing on data that is to be transferred to another node via the data transfer control device and the bus; and

a device for fetching data to be subjected to the processing.

20 18. Electronic equipment comprising:

the data transfer control device as defined in claim 7;  
a device for performing given processing on data that is to be transferred to another node via the data transfer control device and the bus; and

25 a device for fetching data to be subjected to the processing.

19. Electronic equipment comprising:

the data transfer control device as defined in claim 9;

a device for performing given processing on data that is to be transferred to another node via the data transfer control device and the bus; and

a device for fetching data to be subjected to the processing.

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